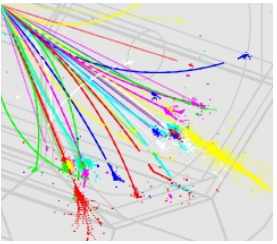
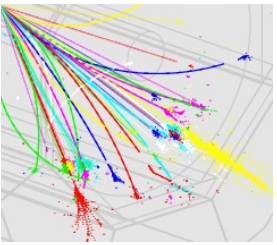


And again ...

SiD PFA Meeting

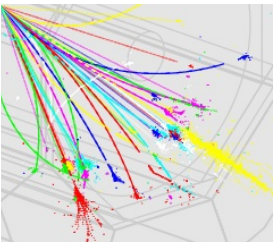
02.07.2008

M. Stanitzki



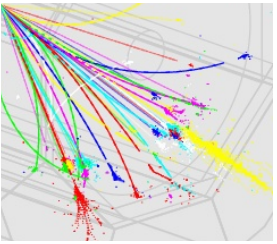
The variants

TAG	Layers	total thickness	Iron thickness	Scintillator thickness	HCAL thickness	λ_{tot}
SIDish_v2_hcal30	30	32.7	26.2	6.5	980	4.92
SIDish_v2_hcal40	40	24.5	18.0	6.5	980	4.61
SIDish_v2_hcal50	50	19.6	13.1	6.5	980	4.45
SIDish_v2_hcal30_I45	30	31.7	25.2	6.5	951	4.75
SIDish_v2_hcal40_I45	40	25.4	18.9	6.5	1016	4.83
SIDish_v2_hcal50_I45	50	21.6	15.1	6.5	1081	4.91
SIDish_v2_hcal60_I45	60	21.6	15.1	6.5	1081	4.91
SIDish_v2_hcal30_I50	30	34.5	28.0	6.5	1035	5.25
SIDish_v2_hcal40_I50	40	27.5	21.0	6.5	1100	5.33
SIDish_v2_hcal50_I50	50	23.3	16.8	6.5	1165	5.41
SIDish_v2_hcal60_I50	60	20.5	14.0	6.5	1230	5.49
SIDish_v2_hcal30_I55	30	37.3	30.8	6.5	1119	5.75
SIDish_v2_hcal40_I55	40	29.6	23.1	6.5	1184	5.83
SIDish_v2_hcal50_I55	50	25.0	18.5	6.5	1249	5.91
SIDish_v2_hcal60_I55	60	21.9	15.4	6.5	1314	5.99
SIDish_v2_hcal30_I40	30	28.9	22.4	6.5	867	4.25
SIDish_v2_hcal40_I40	40	23.3	16.8	6.5	932	4.33
SIDish_v2_hcal50_I40	50	19.9	13.4	6.5	997	4.41
SIDish_v2_hcal60_I40	60	17.7	11.2	6.5	1062	4.49
SIDish_v2_hcal30_I35	30	26.1	19.6	6.5	783	3.75
SIDish_v2_hcal40_I35	40	21.2	14.7	6.5	848	3.83
SIDish_v2_hcal50_I35	50	18.3	11.8	6.5	913	3.91
SIDish_v2_hcal60_I35	60	16.3	9.8	6.5	978	3.99

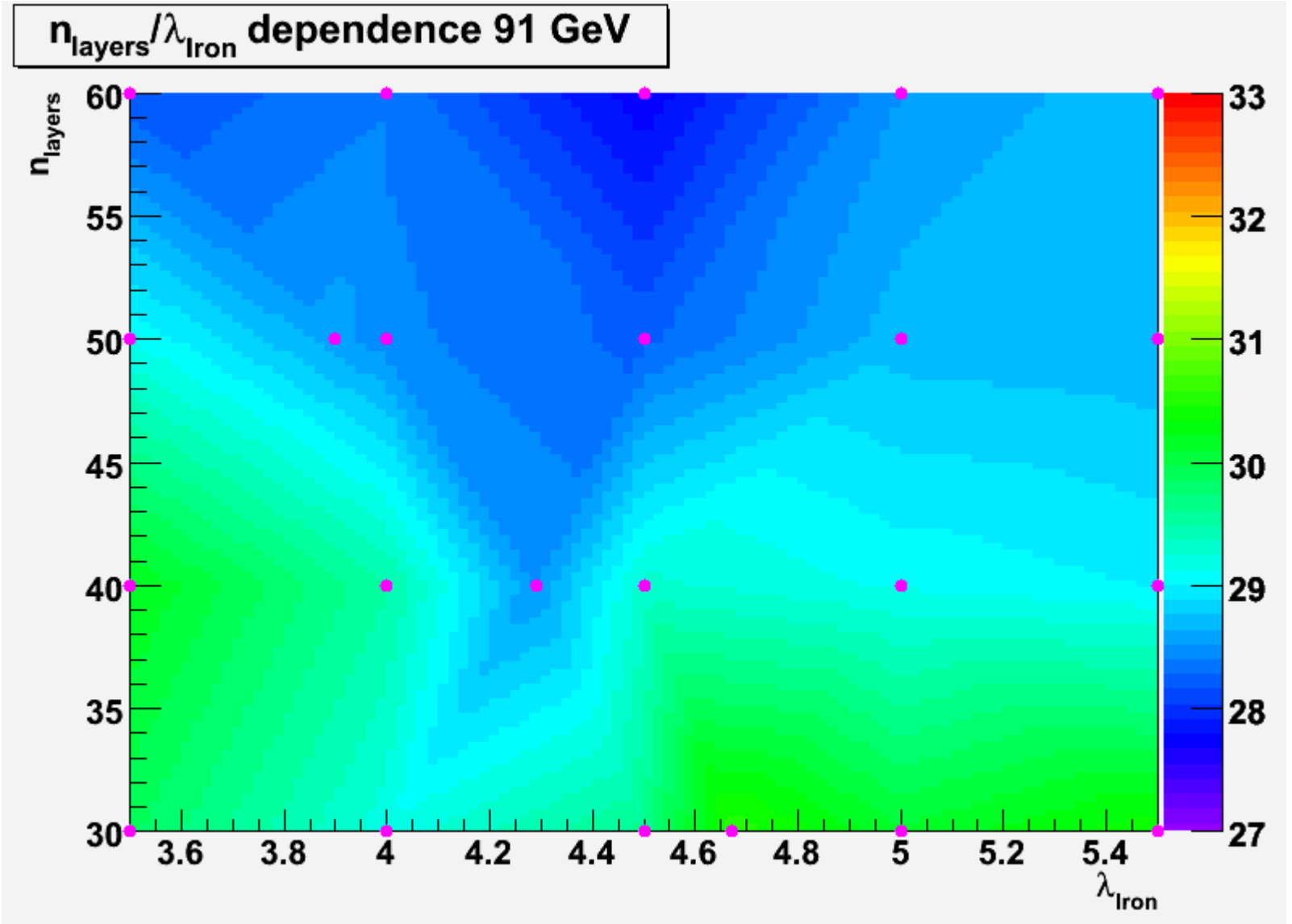


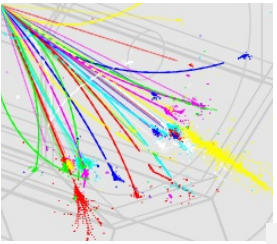
The results

Detector Tag	Layers	uds (91 Gev)		uds (200 GeV)	
		α %	Error	α %	Error
SIDish_v2_hcal30	30	30.5	0.4	40.5	0.7
SIDish_v2_hcal40	40	28.5	0.5	38.2	0.7
SIDish_v2_hcal50	50	28.6	0.4	38.8	0.8
SIDish_v2_hcal30_l45	30	29.6	0.4	39.9	0.7
SIDish_v2_hcal40_l45	40	29.3	0.4	38.7	0.7
SIDish_v2_hcal50_l45	50	28.2	0.7	36.7	0.7
SIDish_v2_hcal60_l45	60	27.7	0.4	38.0	0.8
SIDish_v2_hcal30_l50	30	30.1	0.4	40.6	0.8
SIDish_v2_hcal40_l50	40	29.1	0.4	38.1	0.7
SIDish_v2_hcal50_l50	50	28.7	0.4	38.2	0.7
SIDish_v2_hcal60_l50	60	28.5	0.4	37.0	0.7
SIDish_v2_hcal30_l55	30	30.4	0.4	39.9	0.7
SIDish_v2_hcal40_l55	40	29.0	0.4	38.7	0.7
SIDish_v2_hcal50_l55	50	28.7	0.4	37.1	0.7
SIDish_v2_hcal60_l55	60	28.7	0.4	37.1	0.7
SIDish_v2_hcal30_l40	30	29.1	0.4	40.6	0.7
SIDish_v2_hcal40_l40	40	29.5	0.4	39.9	0.8
SIDish_v2_hcal50_l40	50	28.4	0.4	38.5	0.8
SIDish_v2_hcal60_l40	60	28.4	0.4	36.9	0.8
SIDish_v2_hcal30_l35	30	29.9	0.4	42.1	0.8
SIDish_v2_hcal40_l35	40	30.2	0.4	41.6	0.8
SIDish_v2_hcal50_l35	50	29.1	0.4	39.3	0.8
SIDish_v2_hcal60_l35	60	28.2	0.4	36.8	0.8

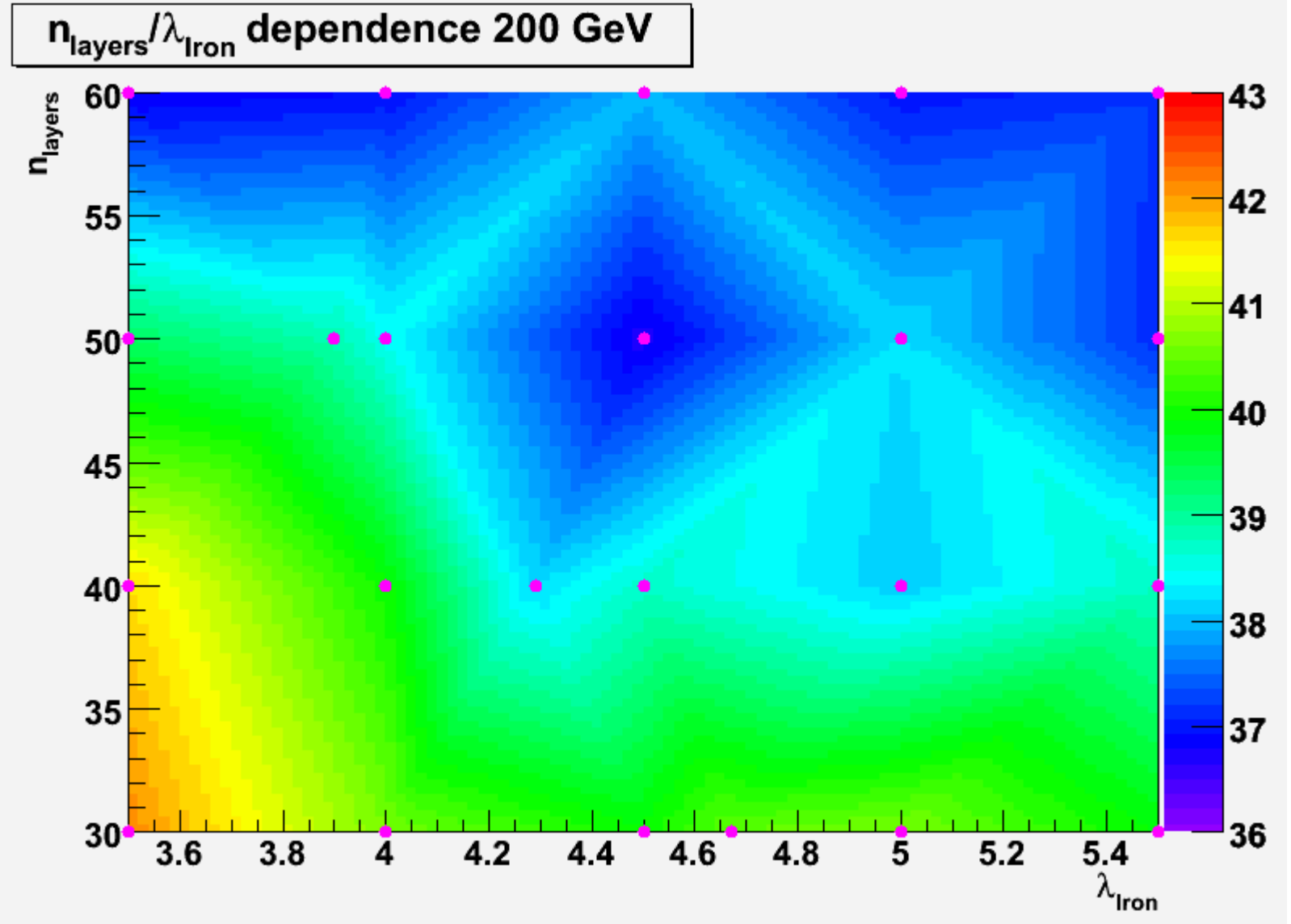


91 GeV

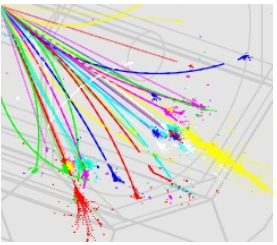

$n_{layers}/\lambda_{Iron}$ dependence 91 GeV
n_{layers}
60
55
50
45
40
35
30
3.6
3.8
4
4.2
4.4
4.6
4.8
5
5.2
5.4
λ_{Iron}
33
32
31
30
29
28
27



200 GeV

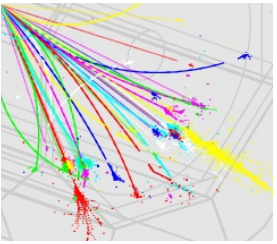

$n_{layers}/\lambda_{Iron}$ dependence 200 GeV
n_{layers}
60
55
50
45
40
35
30
3.6
3.8
4
4.2
4.4
4.6
4.8
5
5.2
5.4
λ_{Iron}
43
42
41
40
39
38
37
36

α



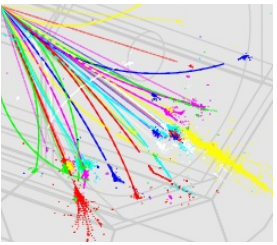
Remarks

- Fresh off the press and not all the points used yet
- Color interpolation done by ROOT ...
- Anyway, it seems to say
  - 50 layers 4.5 λ_{Iron} is a good place to be
- Will add the missing points
- For next week
  - try to parametrize response
  - confirm if $n_{Layers}/\lambda_{Iron} \sim 11$ is a good rule to use



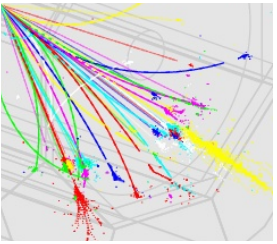
Z dependence

- new since last time
- A stretched SiD with z=2.1 m
- Everything else is the same

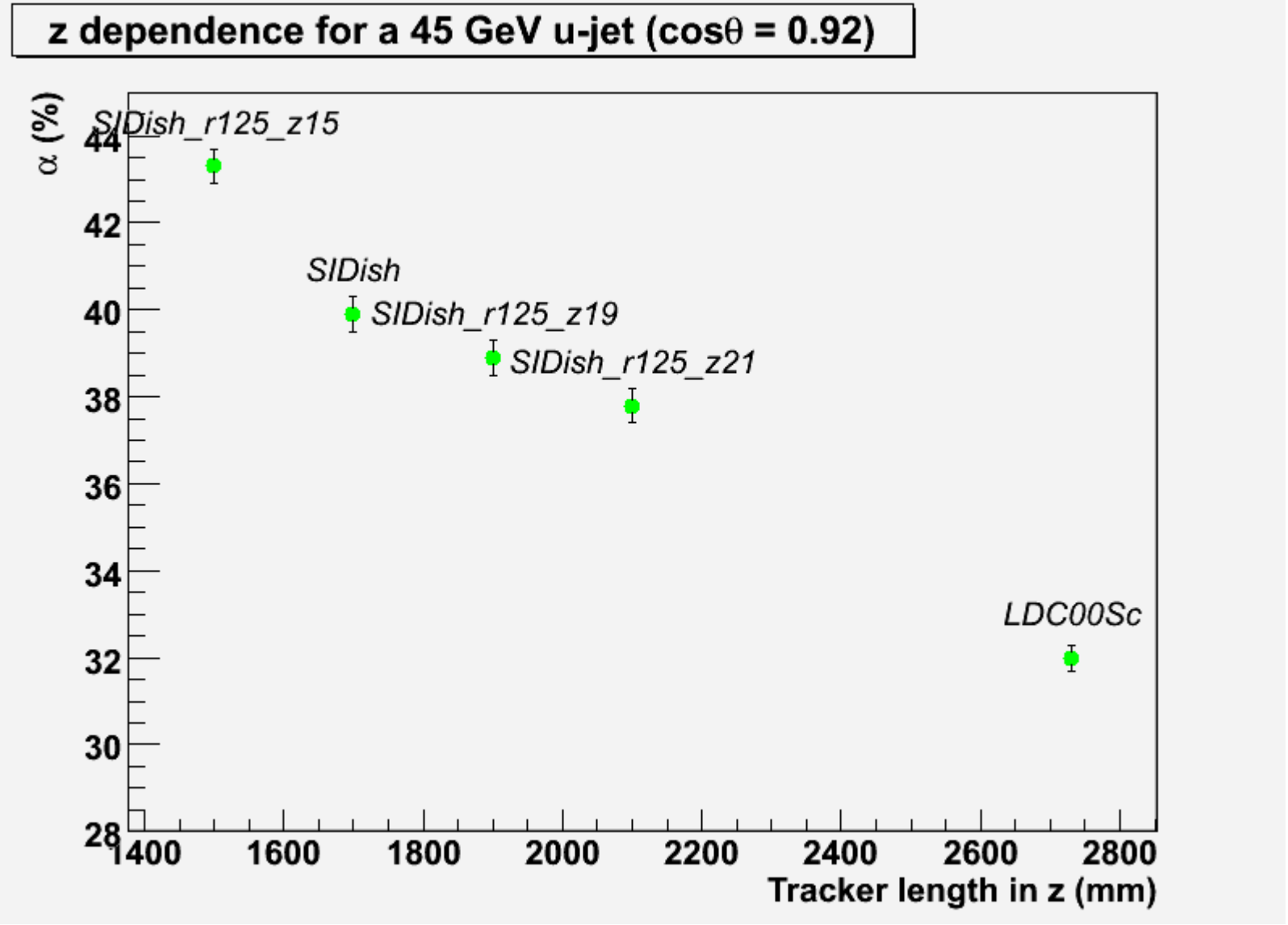


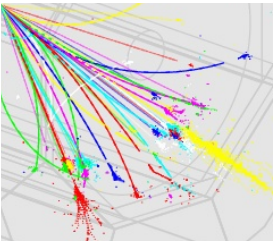
Results

Detector Tag	u (50 GeV)		u (100 GeV)		u (250 GeV)	
	α %	Error	α %	Error	α %	Error
SIDish	39.9	0.4	40.2	0.4	68.8	2.0
LDC00Sc	32.0	0.3	29.6	0.3	80.1	1.0
SIDish_r125_z15	43.4	0.4	44.2	0.5	86.9	1.1
SIDish_r125_z19	38.9	0.4	38.3	0.4	81.6	1.1
SIDish_r125_z21	37.8	0.4	37.0	0.5	75.4	1.0

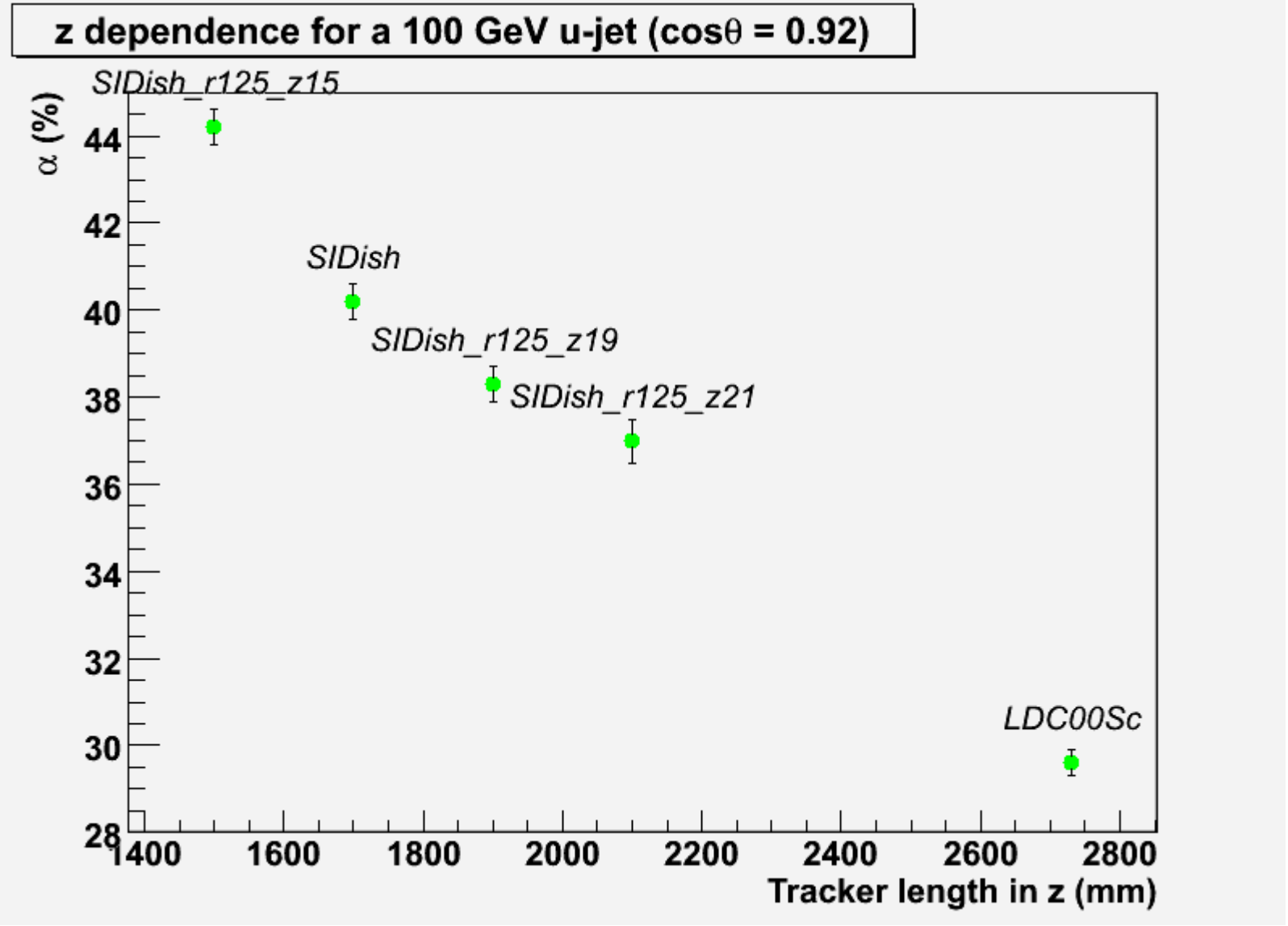


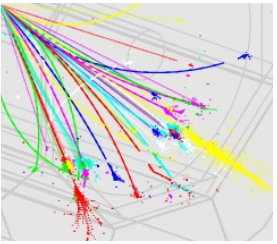
z dependence 45 GeV



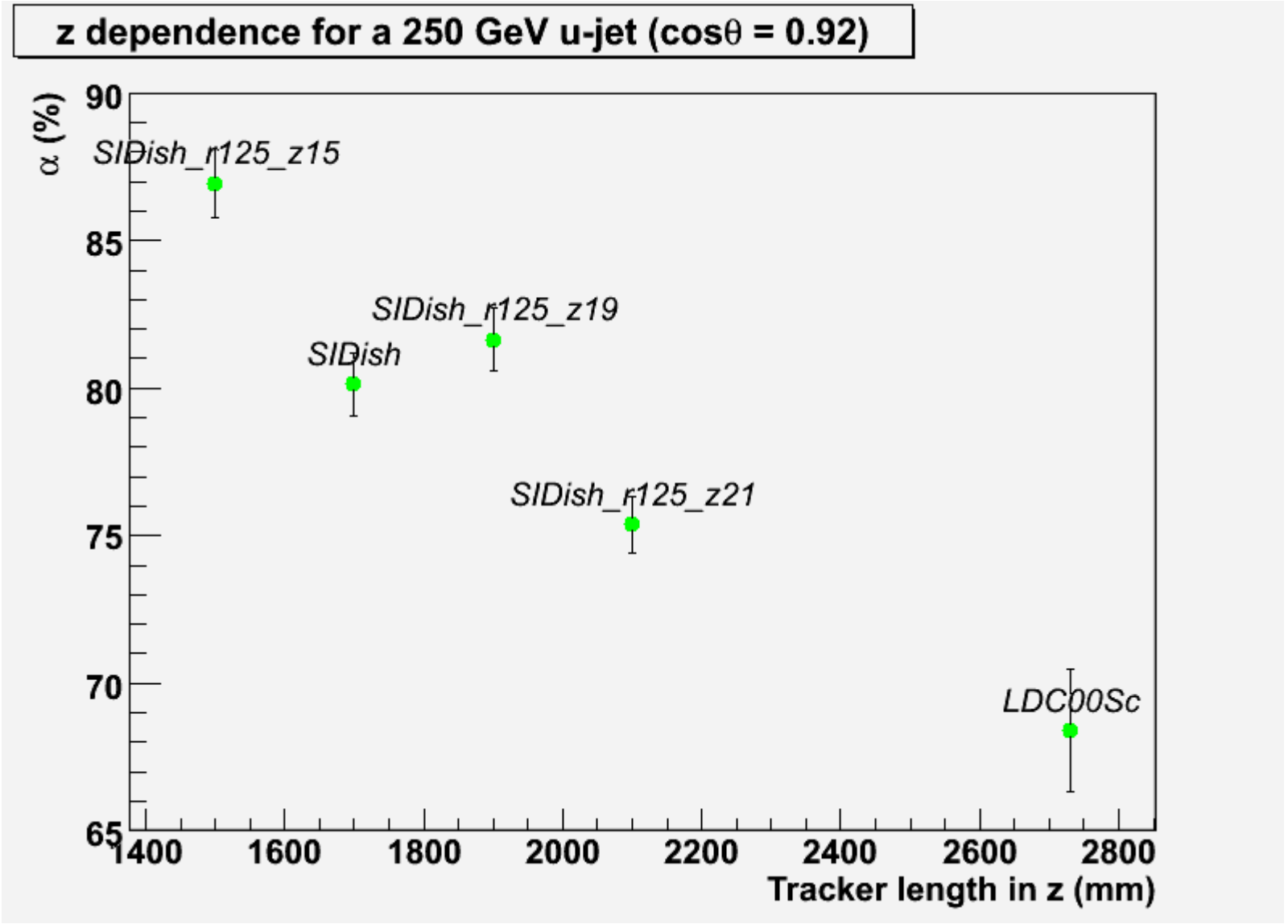


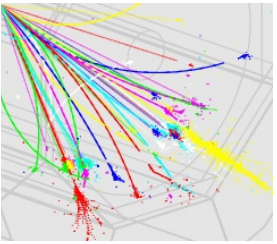
z dependence 100 GeV



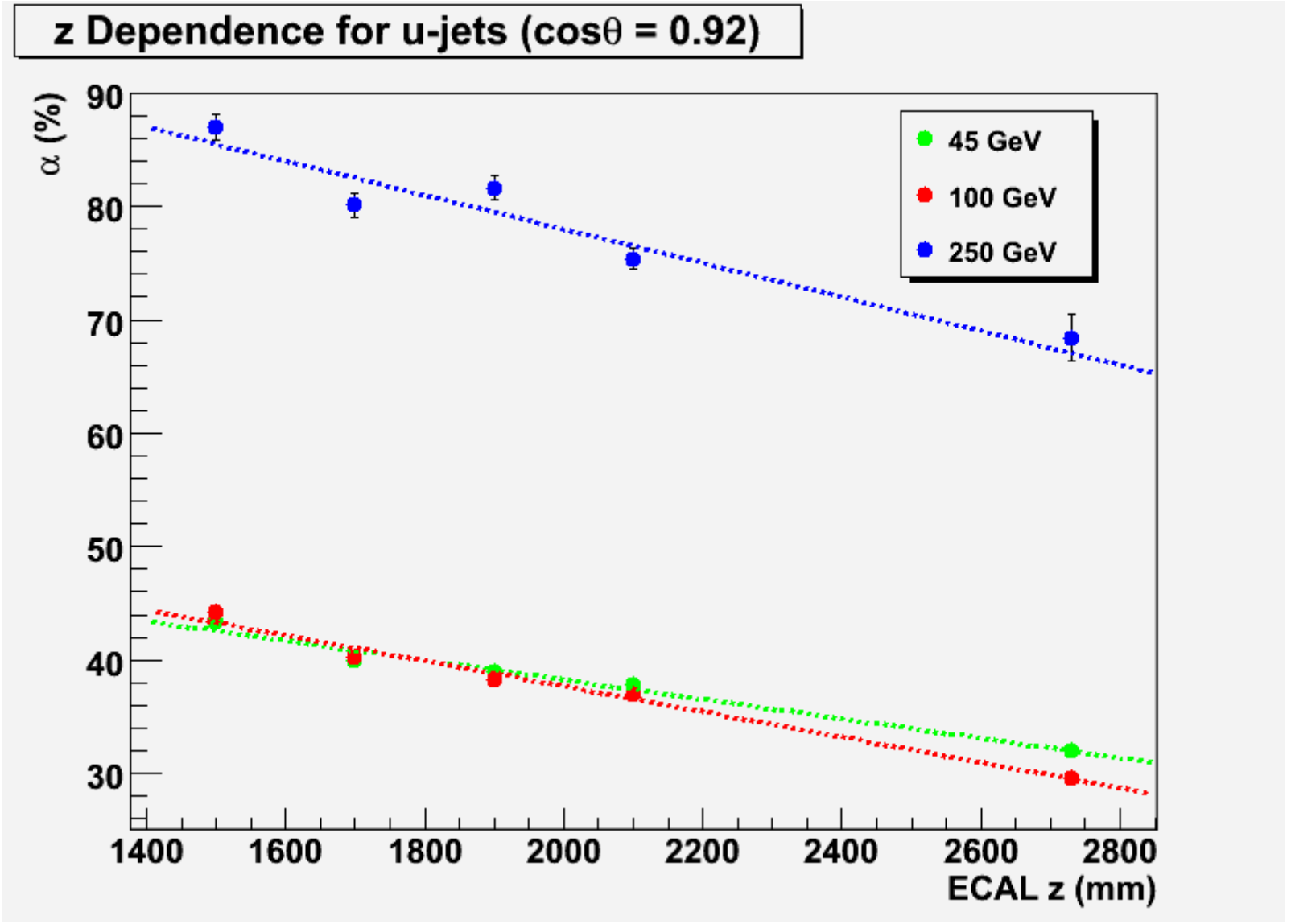


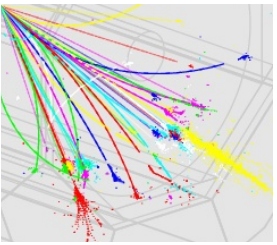
z dependence 250 GeV





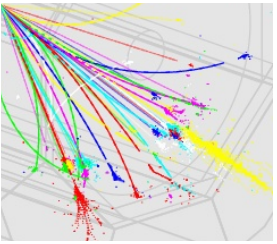
Fit things ...


z Dependence for u-jets (cosθ = 0.92)
α (%)
90
80
70
60
50
40
30
45 GeV
100 GeV
250 GeV
1400
1600
1800
2000
2200
2400
2600
2800
ECAL z (mm)



Fit formulae

- General form for forward performance
  - $\alpha(z) = a_1 \cdot z + a_2$
- For a 45 GeV u-Jet
  - $\alpha(z)_{45\ GeV} = -0.0086 \cdot z + 55.4681$
- For a 100 GeV u-Jet
  - $\alpha(z)_{100\ GeV} = -0.0112 \cdot z + 60.0992$
- For a 250 GeV u-Jet
  - $\alpha(z)_{250\ GeV} = -0.0150 \cdot z + 107.9248$



Other news

- HCAL segmentation is difficult, haven't figured how to set it in Mokka besides hard-coding it
- Started porting stuff to the FNAL computers, will try to get going there soon ...